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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,532

05/26/2005

Jolinde Machteld Van De Graaf

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EXAMINER

VANOY, TIMOTHY C

ART UNIT

PAPER NUMBER

1793

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/536,532	<b>Applicant(s)</b> VAN DE GRAAF, JOLINDE MACHTELD	
	<b>Examiner</b> Timothy C. Vanoy	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>Dec. 20, 2007</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The person having ordinary skill in the art has the capability of understanding the scientific and engineering principles applicable to the claimed invention. The references of record in this application reasonably reflect this level of skill.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over GB 2,275,625 A to Taylor.

The Taylor application describes a method for treating a natural gas contaminated with hydrogen sulfide, organic sulfur compounds (i. e. carbonyl sulfide

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and up to 50 parts per million by volume of mercaptans) as well as carbon dioxide (please see pg. 1 Ins. 1-12), comprising:

contacting the natural gas with an aqueous regenerable absorbent comprising alkanol amine (i. e. di-isopropyl amine or methyl diethanol amine) and a physical solvent such as sulfolane for the satisfactory removal of hydrogen sulfide and up to 95 volume percent of organic sulfur compounds (in particular, mercaptans): please see pg. 1 Ins. 15-21 and also pg. 2 Ins. 12-16;

passing the hydrogen sulfide and mercaptan-loaded absorbent into a regenerator, where the hydrogen sulfide and mercaptans are steam-stripped from the absorbent to produce a hydrogen sulfide and mercaptan-rich off-gas (which is passed to a sulfur recovery plant) and a lean, regenerated absorbent (which is passed back to the absorber): please see pg. 2 Ins. 17-26;

passing the resulting natural gas through a first absorber (containing a suitable molecular sieve such as zeolite 5A or zeolite 13X: please see pg. 2 Ins. 5-8) which removes the residual organic sulfur compounds out of the natural gas (while the first absorber is being used to remove the mercaptans out of the natural gas, a second absorber is being regenerated by passing a bleed stream of heated, purified gas through the second absorber and then passing the resulting, loaded regeneration off-gas into the feed gas entering the amine scrubber), and

switching the flow of the resulting natural gas so that it flows through the second, regenerated absorber, while the first absorber is undergoing the same regeneration that the second absorber was subjected to (please see pg. 3 Ins. 4-30).

The limitations set forth in the applicants' claims describing how much of the hydrogen sulfide, mercaptans, etc. are initially present in the untreated natural gas and how much of the hydrogen sulfide, mercaptans, etc. have been removed by the same process steps are noted, but it is submitted that the same natural gas is going to inherently contain the same hydrogen sulfide, mercaptans, etc. in the same quantities and that the same process for treating the natural gas is going to inherently remove the hydrogen sulfide, mercaptans, etc. to the same degree.

The limitations set forth in the applicants' independent claims describing the weight percentages of the same water, the same amine and the same physical solvent in the same absorbent solution are noted, but the courts have already determined that it is obvious to discover the optimum or workable ranges of such process parameters (to include concentrations or weight percentages) by routine experimentation when the general conditions of a claim are disclosed by the prior art: please note the discussion of the *In re Aller* 220 F.2d 454, 456, 105 USPQ 233,235 (CCPA 1955) court decision set forth in section 2144.05(II)(A) in the MPEP.

### ***Response to Arguments***

Applicants' arguments submitted with his Amendment filed on Dec. 20, 2007 have been fully considered but they are not persuasive.

a) *The Applicant argues that the Taylor publication does not recognize the treatment of gas streams that have a particularly high concentration of mercaptan to*

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*hydrogen sulfide, and the need to use a particular type of washing solution in combination with molecular sieves to treat such a gas stream.*

No distinction is seen or has been shown between the gas streams that the Applicant treats and the process of the Taylor publication treats: please note that both the Applicant and Taylor treat the same natural gas stream (compare the limitations of Applicant's claim 5 to the disclosure set forth in pg. 1 Ins. 9-11 in the Taylor publication, both of which disclose that the gas stream being treated is natural gas). No distinction is seen or has been shown between the relative concentrations of mercaptans and hydrogen sulfide in the same natural gas stream: please compare the mercaptan concentration limitations of 10 to 1,500 ppmv mercaptans set forth in Applicant's claim 2 to the mercaptan concentration disclosure of "up to 500 ppmv" set forth in pg. 1 Ins. 11-12. No distinction is seen or has been shown between the washing solution that the Applicant uses and the process of Taylor uses: please compare the limitations set forth in the Applicants' independent claims of limiting the washing solution to contain: (1) water; (2) amine and (3) a physical solvent to the disclosure set forth on pg. 1 Ins. 15-18 in the Taylor publication which sets forth that their washing solution also contains an aqueous solution of an amine together with a physical sorbent (such as sulfolane). No distinction is seen or has been shown between the molecular sieves used: please compare the limitations set forth in Applicant's claim 11 which identifies the molecular sieve as being either zeolite A or zeolite X, and the disclosure set forth on pg. 2 Ins. 6-8 in the Taylor publication which identifies the molecular sieve as being either zeolite 5A or zeolite 13X.

b) *The Applicant argues that the gas stream of the Applicant's process is not typical of all natural gas streams. Instead, it has a composition and properties that are not generally found in all gas streams and which make the treatment of the gas stream particularly difficult.*

No distinction is seen or has been shown between the natural gas that the Applicant treats and the natural gas that the process of the Taylor publication treats.

c) *The Applicant argues that there is nothing in the Taylor teachings to indicate that an aqueous washing solution have the Applicant's specifically claimed composition is required in order to effectively treat the claimed gas stream to adequately remove the sulfur therefrom.*

This is not persuasive for at least the reasons set forth in sub-paragraph (a) in this portion of the Office Action.

d) *The Applicant argues that the limitations of claims 9 and 16 (which are directed to cooling the washed gas stream and the removal of condensate therefrom before passing the gas stream to the molecular sieve absorption step) is not taught in the Taylor publication.*

The argument is not persuasive because expected advantages are evidence of obviousness. It is obvious to remove the water from the washed gas by any known and conventional means (such as the cooling and condensation of Applicants' claims 9 and 16) because of the expected advantage of minimizing sorption of the water into the zeolite molecular sieve (which would, in turn, minimize the binding capacity of the zeolite for the sulfur species by occupying sorption sites within the zeolite that would

otherwise be occupied by the sulfur species), as suggested on pg. 4 Ins. 12-18 in the Taylor publication.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy C. Vanoy whose telephone number is 571-272-8158. The examiner can normally be reached on Mon-Fri 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Timothy C Vanoy/  
Primary Examiner, Art Unit 1793

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